

IN THE UNITED STATES DISTRICT COURT  
FOR THE NORTHERN DISTRICT OF OHIO  
WESTERN DIVISION

Harsco Corporation,

Case No. 3:06 CV 2110

Plaintiff,

MARKMAN ORDER

-vs-

JUDGE JACK ZOUHARY

North Star Bluescope Steel, LLC,

Defendant.

**BACKGROUND**

This matter is before the Court for construction of certain terms found in five claims of U.S. Patent No. 5,397,379 (the 379 Patent) in accordance with *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390-91 (1996). The parties filed briefs (Doc. Nos. 21-22, 26-27 and 32) and the Court held a hearing on May 21, 2007. No other court decisions have addressed construction of the contested terms of the 379 Patent.

Plaintiff Performix Technologies, Ltd. (Performix) brought this action against Defendant North Star Bluescope Steel, LLC (North Star) asserting infringement of the 379 Patent. Performix later transferred to Harsco Corporation (Harsco) all rights to the 379 Patent and Harsco was substituted as Plaintiff. Defendant North Star is in the steel-making business and manufactures 140 tons of steel approximately every 40 minutes. Most of the product is sheet steel which goes through a hot roll process, a kneeling process and then is cold rolled and used primarily for the auto industry.

North Star operates an electric arc furnace (EAF). This EAF is charged with scrap metal which then is heated to nearly 2800° F. The scrap metal at this temperature becomes liquid steel. Slag is added to protect the steel from being exposed to oxygen and to pull impurities, such as sulfur and

phosphorus, out of the steel. Depending upon the end product of steel, various elements are added such as calcium, aluminum, magnesium or silica. These additives occur in the ladle metallurgy furnace (LMF). It is this additive process that is the central part of the claims in this lawsuit.

#### **APPLICABLE LAW**

It is the duty of the Court, not a jury, to construe a patent claim. *Markman*, 517 U.S. at 391. Language in a particular claim must be construed in the context of both the individual claim and the entire patent, including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*). The specification should be read in light of the prosecution history which is the primary basis for construing a patent claim. *Id.* at 1350. Courts may also rely on extrinsic evidence -- that is, evidence other than the patent and its prosecution history -- but that evidence is secondary to the intrinsic evidence. *Id.* at 1317.

The parties agree that the 379 Patent is to be construed based on the ordinary and customary meaning of the words by giving those words meaning in light of the patent specification as understood by those of ordinary skill in the art at the time the patent application was filed. *Id.* 1312-13; Tr. 13-14. The patent at issue in this case is directed to ladle refining (Tr. 14). Dictionary definitions are extrinsic evidence and unnecessary if the Court can glean from the claim and the patent history the meaning of the language (Tr. 15). Sometimes, the ordinary and customary meaning of claim language to a person of ordinary skill in the art may be identical to the meaning that language would have to a lay person not skilled in the art. *Phillips*, 415 F.3d at 1314.

## CLAIM CONSTRUCTION

### Claim 1

In a process of ladle refining of steel comprising the steps of disposing in a ladle a quantity of molten steel to be refined, adding a material which forms a covering of a molten protective ladle metallurgy slag on the steel in the ladle and refining the steel in the ladle to the desired metallurgical condition, the improvement comprising: adding as the ladle metallurgy furnace additive **a solid material comprising** from about 10% to about 90% of a solid recycled ladle metallurgy furnace slag and from about 10% to about 90% of a raw material selected from the group consisting of: a calcium oxide source; soda ash; fluorspar; borax; calcium aluminate; an aluminum source; an alumina source; calcium carbonate; metallic calcium, magnesium, and sodium and their oxides, fluorides and carbides; and mixtures of all the foregoing. (emphasis added)

This claim describes the process “of ladle refining” -- that is, the method and steps. The key phrase in dispute here is “a solid material comprising.”<sup>1</sup> Defendant argues this means a mixed solid material of two components -- recycled LMF slag and a raw material. Plaintiff’s position is that Claim 1 never mentions a mixture of those two components and that Defendant is improperly attempting to limit the claim to mixtures. The specifications of the patent discuss three methods by which slag and raw materials may be added during the steeling refining process. Those three methods are: (1) solid granular mix; (2) briquetted mixtures; and (3) LMF slag ground separately from raw materials and added separately in at least two steps (Tr. 21).

Defendant claims the last method does not apply to Claim 1 but is only directed to Claim 24. Plaintiff argues the three examples in the specification entitled “summary of the invention” do not limit the invention.

The Court agrees that solid material means something that is not liquid or gas, a point now conceded by Defendant (Amended Post Hearing Brief at p. 4). This meaning is supported by the

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Claims 21-24 are dependent on Claim 1 and also dependent upon the definition of “a solid material.”

history of the patent designed to improve upon the prior art using a liquid. Defendant would have the Court limit the phrase to mean a “mixed” solid material (Tr. 27). But that is not what it says, and the word “mixed” is used elsewhere in the patent. Also, as used in this phrase, solid material means something more than a single substance because the phrase discusses a solid material “comprising . . . slag and . . . raw material . . .”. And the raw material may be a “mixture” made up of itemized items (“selected from a group”). But the claim does not define the raw material mixture as being mixed with the slag material -- the two materials could be added separately.

### **Claim 21**

The process according to claim 1, wherein the ladle metallurgy addition comprises particles that pass through the screen having four inch square openings.

The dispute here centers on the phrase “particles that **pass** through a screen” (emphasis added). The Court agrees with Plaintiff’s reading. Plaintiff claims that the verb “pass” refers to particles and that particles does not mean briquettes alone.

Defendant argues that this claim refers to the additive -- something that is added either as a granular, mixture or briquette -- and that is made up of particles (Tr. 42-43). The Court agrees that this claim further refines the metallurgy addition referenced in Claim 1. However, Defendant’s explanation that “pass” refers to “addition” is strained. The verb “pass” describes the closest preceding noun: “particles” (Tr. 46). To paraphrase the meaning of this claim, the additive is made up of particles which are of a size small enough to pass through a screen with four inch square openings.

### Claim 22

The process according to claim 1, wherein the solid ladle metallurgy additive is in the form of a briquette.

Plaintiff argues that the claim is silent as to how the briquette is formed and simply requires the additive to be “in the form of a briquette.” In other words, Plaintiff’s position is that the claim is only concerned with the shape of the additive and not how it is formed (Tr. 49). The Court agrees.

Defendant argues that the Court should import the definition of briquette from the specification which details how a briquette is made (Tr. 50). But the Court need only go to the specification if the claim language needs clarification. Here, the language is straightforward: namely, that the additive needs to be in the form of a briquette. To accept Defendant’s definition would be to render the phrase “in the form of” meaningless. In other words, Defendant would have the Court read out the words “in the form of” and import from the specification how a briquette is made (p. 50). But that is not the plain reading of the phrase.

### Claim 23

The process according to claim 1, wherein the ladle metallurgy additive is a **completely mixed granular material** that is predominantly no larger than material that passes through a screen having one-inch square openings and no smaller than that which is retained by a 20-mesh screen. (emphasis added)

The key dispute here is with the phrase “a completely mixed granular material.” Defendant’s position is that this means a solid material with a mixture of recycled slag and raw material, each in the form of granules uniformly mixed together. Defendant says “completely” means “all” or “uniformly.” Plaintiff’s position is there is no mention of the particles being uniform. In other words, completely does not mean uniformly. Also, uniformly is used elsewhere in the patent, but not here.

Defendant again refers the Court to the specification which discusses “uniformly mixed granular material.” But the specification never uses the word “completely” (Tr. 53-54). Defendant also argues that “if you go to the dictionary definition of completely, it says fully” (Tr. 54). The Court does not agree that the word “uniformly” is what is meant by “completely.” Those two words have different meanings and are used in different places in the patent documents to convey specific, not synonymous, meanings.

#### Claim 24

The process according to claim 1, wherein the process further comprises adding the recycled ladle metallurgy additive to the molten steel in granular form in at least two separate steps wherein a substantial portion of the granular recycled ladle metallurgy furnace slag is added before the raw materials.

The parties agree that Claim 24 has all the limitations of Claim 1. Defendant argues, and the Court agrees, that this claim calls for a “further” process which consists of at least two separate steps requiring “a substantial portion” of the slag to be added before the raw materials. The parties dispute whether a mixture is required as an additive. Defendant argues there is no way the claim can be performed in two steps without having a mixture in at least one of the steps (Tr. 61).

The key phrase here is “substantial portion” (Tr. 58). Plaintiff says this means up to 100% and Defendant says it must be less than 100%. Plaintiff’s position is that neither Claim 1 nor Claim 24 mention a **mixture** of LMF slag and raw material and that Claim 24 calls for **at least** two steps in the process. Defendant’s position is that Claim 1 is limited to a mixture and Claim 24 is limited to at least one step which is the addition of a mixture of recycled LMF slag and raw materials as described in Claim 1.

The Court agrees with the common sense reading that “a substantial portion” could be up to and including 100%, depending on the number of steps. As described by Plaintiff’s counsel (Tr. 63):

If you want to do it in two steps, you keep them [recycled slag and raw materials] separate; you put them in separately. The substantial portion there is 100 percent. But the claim is drafted to accommodate 75 percent, and then all of the raw material, then 25 percent, . . . The claim is drafted to cover all of those possibilities. And it clearly does.

The Court's reading of Claim 24 is consistent with its reading of Claim 1.

### **Claim 25**

A solid ladle metallurgy furnace additive for use in a treating molten steel in a ladle metallurgy furnace comprising from about 10% to about 90% by weight of a solid recycled ladle metallurgy furnace slag material and from about 10% to about 90% by weight of a raw material selected from the group consisting of: a calcium oxide source; soda ash; fluorspar; borax; an aluminum; an alumina source; calcium carbonate; calcium aluminate; metallic calcium, magnesium, and sodium and their oxides, fluorides and carbides; and mixtures of all the foregoing.

Claims 1 and 25 are independent. Claim 1 describes the process step by step, while Claim 25 is directed to the product (Tr. 68). While Claim 1 includes the step of adding solid material, Claim 25 does not include any such term (Tr. 66). The key phrase here is the meaning of "a solid ladle metallurgy furnace additive." The parties agree that the "solid additive" should have the same meaning in both Claims 1 and 25 (Amended Post Hearing Brief at p. 12).

But Defendant argues that "a" means **one** solid material composed of two essential elements (recycled LMF slag and a raw material), whereas Plaintiff argues material can be singular or plural.

Plaintiff argues the different words used here than in Claim 1 necessarily mean this claim "doesn't say that the additive is a solid material" formed of a mixture (p. 66). Defendant correctly points out that "a" is used three times in this claim, each time denoting a single, or one, item -- a(n) additive, a slag material, and a raw material -- while "material" may be singular or plural, here it is used in a singular sense, recognizing that the material may be made up of more than one substance or ingredient. Here, the additive is made up of slag material and raw material.

### CONCLUSION

In light of the patent's specification (including the claims), the prosecution history, the purpose of the 379 Patent as disclosed in all of this intrinsic evidence, and the ordinary meaning of the claim language, the Court construes the relevant claim language as set forth above.

IT IS SO ORDERED.

s/ Jack Zouhary  
JACK ZOUHARY  
U. S. DISTRICT JUDGE

July 31, 2007